YUSHI TANG

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Department of Biostatistics

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Education

From 2019	*Princeton University*	Princeton, NJ, USA
	Ph.D. Candidates in Quantitative and Computational Biology	
2017 - 2019	*Harvard T. H. Chan School of Public Health (HSPH)*	Boston, MA, USA
	M.S. in Computational Biology and Quantitative Genetics	
2016 - 2017	*Department of Statistics, UCLA*	Los Angeles, CA, USA
	Cross-disciplinary Scholars in Science and Technology	
2013 - 2017	*Peking University (PKU)*	Beijing, P.R.China
	B.S. in Environment Sciences Concentration in Environmental Statistics	
	B.A. in Economics	

Research Experience

From 2018	**RA, Department of Biostatistics, HSPH**	Supervisor: Prof. Xihong Lin

The Genome Sequencing Program of the National Human Genome Research Institute

◆ Developed methods and software for the gold-standard quality control (QC) procedure to analyze large-scale whole-genome sequencing data.

◆ Designed protocols and algorithms for predicting sample population, identifying duplicated samples, and making accurate sex inference based on GSP's genotype data.

2016 - 2017	**CSST Scholar & RA, Department of Statistics, UCLA**	Supervisor: Prof. Jingyi Jessica Li

ENCODE-DREAM Challenge: Predictions on *in vivo* Transcription Factor Binding Site

◆ Identified 4 crucial features from 14 original variables in ENCODE database for prediction including the accessibility of chromatin, the PWM scores of specific motifs, the DNA 3D Shape parameters, and k-mers of DNA sequence.

◆ Developed a two-round selection model by using Bayesian Inference and Random Forests, which performed well for predictions on in vivo transcription factor binding site.

2015 - 2017	**RA, Lab of Water Environmental Biotechnology, PKU**	Supervisor: Prof. Donghui Wen

Bio-information Analysis of Microbial Community in the Sediment of Hangzhou Bay

◆ Developed a tripartite network and dimensional reduction method (TMEN) for integral analysis of 16S rRNA data, large-scale metagenomic data, and high-dimensional environmental data.

◆ Applied TMEN to studying the marine microbial-environmental ecological network and discovered two ecological mechanisms including how the microbe become crucial species in a complex microbial-ecological network, as well as how to identify key taxonomic categories in complex microbial communities.

Awards and Honors

2019	**Lewis-Sigler Institute Scholars Award** in Quantitative and Computational Biology
	Awarded by Lewis-Sigler Institute, Princeton University
2017	**Outstanding Graduate of Beijing** as a Bachelor
	Awarded by the Beijing Municipal Commission of Education
2017	**Excellent Graduate** who has demonstrated outstanding performance
	Awarded by Peking University
2016 & 2015	**National Scholarship** (2/1000)
	Awarded by Ministry of Education of the People's Republic of China
2016 & 2015	**Merit Student Pacesetter**

Awarded by Peking University

2016 **UCLA Cross-disciplinary Scholars in Science and Technology Award**

In recognition of outstanding research and presentation skills

2014 - 2017 **Peking University Outstanding Researchers Program (Spark Program) Fellowship**

Campus-wide honor awarded by PKU

2014 - 2017 **Top-notch Students Training in Basic Disciplines Fellowship in China**

Nationwide honor awarded by the Ministry of Education of China

Publications

A1 **Tang Y**, Dai T, Su Z, Hasegawa K, Tian J, Chen L, and Wen D. (2018) Tripartite community structure of microbial-environment network indicates how crucial species influence the microbial community ecology [J]. *Microbial Ecology.* (Accept, 2019)

A2 Zhao M, **Tang Y**, Kim H, and Hasegawa K. (2018) Machine learning with k-means dimensional reduction for predicting survival outcomes in patients with breast cancer [J]. *Cancer Informatics.* 2018 Nov. DOI: 10.1177/1176935118810215

A3 Dai T, Zhang Y, Ning D, Su Z, **Tang Y**, Huang B, Mu Q, and Wen D. (2018) Dynamics of sediment microbial functional capacity and community interaction networks in an urbanized coastal estuary [J]. *Frontiers in Microbiology.* 2018 Nov. DOI: 10.3389/fmicb.2018.02731

A4 Su Z, Dai T, **Tang Y**, Tao Y, Huang B, Mu Q, and Wen D. (2018) Sediment bacterial community structures and their predicted functions implied the impacts from natural processes and anthropogenic activities in coastal area [J]. *Marine Pollution Bulletin.* 2018 Apr. DOI: 10.1016/J.MARPOLBUL.2018.04.052

A5 Dai T, Zhang Y, **Tang Y**, Bai Y, Tao, Y, Huang B, and Wen D. (2016) Identifying the key taxonomic categories that characterize microbial community diversity using full-scale classification: a case study of microbial community in the sediments of Hangzhou Bay [J]. *FEMS Microbiology Ecology.* 2016 Oct. DOI: 10.1093/femsec/fiw150

Conference Proceedings

C1 Dai T, Zhang Y, **Tang Y**, and Wen D. (2016) Metagenomics reveals microbial community dynamics under natural and anthropogenic impact in the sediment of Hangzhou Bay, China [C]. The 3rd Xiamen Symposium on Marine Environmental Sciences (XMAS-III). http://mel.xmu.edu.cn/conference/3XMAS/program_info.asp?id=251

Teaching Experience

2019 Spring Department of Statistics, Harvard University Instructor: Dr. X. Shirley Liu

Teaching Assistant: STAT 215 / BST 282 Intro to Computational Biology and Bioinformatics

2018 Summer Department of Biostatistics, HSPH Instructor: Dr. Garrett Fitzmaurice

Teaching Assistant: BST 215 Linear and Longitudinal Regression

Computer Skills

Programming languages	Proficient in C, Python, R, and MATLAB
Cluster Computing	Familiar with AWS, GCP, Odyssey, and Orchestra
Software	Basic statistics: SAS, Stata, Origin, and SPSS
	Bioinformatics: Bioconductor, MeV, LIMMA, DAVID, COMBAT, FastQC, Seurat, and DESeq
	Network Analysis: Cytoscape
	GWAs and Statistical Genetics: PLINK
Others	Familiar with databases including PUBMED, ENCODE, KEGG, UCSC, GEO, and cBioPortal

Lab Skills

Molecular Biology	PCR, qPCR, site-directed mutagenesis
Chemistry	Frequent user of GC-MS, GC-MS/MS, ultraviolet spectrophotometer, fluorescence spectrophotometer and Abbe refractometer

Organizational Experience

2016 - 2017 **The 34th Students' Union of Peking University**
The undergraduate standing committee member

2015 - 2016 **The 8th Students' Union of College of Environmental Sciences and Engineering, PKU**
The undergraduate vice-chair of academics

2015 - 2017 **Debating Team of College of Environmental Sciences and Engineering, PKU**
Captain and coach

2015 - 2016 **The Accordion Band of PKU**
Permanent conductor and the previous first accordion

2013 - 2017 **The Chorus of College of History & CESE in Peking University**
Chorus conductor

Interests

Accordion, Chorus & Symphony Conductor, Debate, Swimming, Badminton